

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims

Claims 1-12 (canceled)

Claim 13 (currently amended). The process of claim ~~12~~ 34, in which the reacting step comprises reacting the amorphous layer with NH_3 so that carbon groups are removed from gallium dimethyl amide.

Claim 14 (currently amended). The process of claim ~~12~~ 34, in which the heating step comprises heating the amorphous layer in a N_2 or NH_3 atmosphere.

Claim 15 (currently amended). The process of claim ~~12~~ 34, in which the heating step comprises heating the amorphous layer at a temperature preferably between 900°C – 1100°C .

Claim 16 (currently amended). The process of claim ~~12~~ 34, in which the crystal substrate is a single crystal substrate selected from the group consisting of C-plane (0001) Al_2O_3 , r-plane (01-12) Al_2O_3 , r-plane Al_2O_3 , (001) LiGaO_2 and (100) LiAlO_2 .

Claim 17 (currently amended). The process of claim ~~12~~ 34, in which the crystal substrate is C-plane (0001) Al_2O_3 .

Claim 18 (currently amended). The process of claim ~~12~~ 34, in which the crystal substrate is r-plane (01-12) Al_2O_3 .

Claim 19 (canceled).

Claim 20 (currently amended). The process of claim ~~19~~ 35, in which the oxygen-containing gallium salt is gallium nitrate.

Claim 21 (canceled).

Claim 22 (currently amended). The process of claim ~~21~~ 36, in which the oxygen-containing gallium alkoxide is gallium isopropoxide.

Claim 23 (original). The process of claim 20 or 22, in which the crystal substrate is a single crystal substrate selected from the group consisting of C-plane (0001) Al_2O_3 , r-plane (01-12) Al_2O_3 , r-plane Al_2O_3 , and SiC.

Claim 24 (original). The process of claim 20 or 22, in which the crystal substrate is C-plane (0001) Al_2O_3 .

Claim 25 (original). The process of claim 20 or 22, in which the crystal substrate is (01-12) Al_2O_3 .

Claim 26 (original). The process of claim 20 or 22, in which the heating step comprises heating the amorphous layer in an NH_3 atmosphere.

Claim 27 (original). The process of claim 20 or 22, in which the heating step comprises heating the amorphous layer at a temperature preferably between 900°C – 1100°C .

Claim 28 (original). The process of claim 20 or 22, in which the reacting step and the heating step are carried out simultaneously.

Claim 29 (original). A process for producing crystalline gallium nitride thin films on a crystal substrate, the process comprising the steps of:

(a) depositing an amorphous layer of gallium dimethyl amide by spin coating a solution of gallium dimethyl amide on a single crystal substrate;

(b) reacting the amorphous layer with NH_3 so that carbon groups are removed from the amorphous layer of gallium dimethyl amide; and

(c) after the reacting step, heating the amorphous layer in a N_2 or NH_3 atmosphere at a temperature and for a time sufficient to crystallize the amorphous layer by pyrolysis.

Claim 30 (original). A process for producing crystalline gallium nitride thin films on a crystal substrate, the process comprising the steps of:

(a) depositing an amorphous layer of a gallium nitride precursor by spin coating a solution of gallium nitrate or gallium isopropoxide on a single crystal substrate;

(b) reacting the amorphous layer with NH_3 so that the amorphous layer is reduced and subject to nitridation; and

(c) simultaneously with the reacting step, heating the amorphous layer in an NH_3 atmosphere at a temperature and for a time sufficient to crystallize the amorphous layer by pyrolysis.

Claim 31 (new). A process for producing crystalline III-V compound films on crystal substrates, the process comprising the steps of:

(a) depositing an amorphous layer of a Group III-dimethyl amide on a crystal substrate;

(b) reacting the amorphous layer with a reduced form of a Group V element; and

(c) after the reacting step, heating the amorphous layer at a temperature and for a time sufficient to crystallize said amorphous layer by pyrolysis.

Claim 32 (new). A process for producing crystalline III-V compound films on crystal substrates, the process comprising the steps of:

(a) depositing an amorphous layer of an oxygen-containing Group III salt on a crystal substrate;

(b) reacting the amorphous layer with a reduced form of a Group V element; and

(c) after the reacting step, heating the amorphous layer at a temperature and for a time sufficient to crystallize said amorphous layer by pyrolysis.

Claim 33 (new). A process for producing crystalline III-V compound films on crystal substrates, the process comprising the steps of:

(a) depositing an amorphous layer of an oxygen-containing Group III alkoxide on a crystal substrate;

(b) reacting the amorphous layer with a reduced form of a Group V element; and

(c) after the reacting step, heating the amorphous layer at a temperature and for a time sufficient to crystallize said amorphous layer by pyrolysis.

Claim 34 (new). A process for producing crystalline III-V compound films on crystal substrates, the process comprising the steps of:

(a) depositing an amorphous layer of gallium dimethyl amide on a crystal substrate;

(b) reacting the amorphous layer with a reduced form of a Group V element; and

(c) after the reacting step, heating the amorphous layer at a temperature and for a time sufficient to crystallize said amorphous layer by pyrolysis.

Claim 35 (new). A process for producing crystalline III-V compound films on crystal substrates, the process comprising the steps of:

(a) depositing an amorphous layer of an oxygen-containing gallium salt on a crystal substrate;

(b) reacting the amorphous layer with a reduced form of a Group V element; and

(c) after the reacting step, heating the amorphous layer at a temperature and for a time sufficient to crystallize said amorphous layer by pyrolysis.

Claim 36 (new). A process for producing crystalline III-V compound films on crystal substrates, the process comprising the steps of:

(a) depositing an amorphous layer of an oxygen-containing gallium alkoxide on a crystal substrate;

(b) reacting the amorphous layer with a reduced form of a Group V element; and

(c) after the reacting step, heating the amorphous layer at a temperature and for a time sufficient to crystallize said amorphous layer by pyrolysis.